Test Report issued under the responsibility of:

SGS

TEST REPORT
IEC 60598-2-1
Luminaires
Part 2: Particular requirements:
Section One – Fixed general purpose luminaires

Report Number. .....:	GZES140800982001
Date of issue .....:	2014-08-29
Total number of pages.....	43
Applicant's name.....:	Minwa Electronics Co., Ltd.
Address .....:	22nd Floor, Far East Finance Centre, 16 Harcourt Road, Admiralty, Hong Kong
Test specification:	
Standard .....:	IEC 60598-2-1:1979 + A1:1987 used in conjunction with IEC 60598-1:2008
Test procedure .....:	CE/LVD
Non-standard test method……..:	N/A
Test Report Form No.....:	IEC60598_2_1C
Test Report Form(s) Originator.....:	Intertek Semko AB
Master TRF.....:	2012-11

Copyright © 2012 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....:	LED lamp
Trade Mark .....:	
Manufacturer.....:	Same as applicant
Model/Type reference .....:	See below rating
Ratings .....:	12 V; GU5.3 lamp cap; LED- MR16385AW, LED- MR16385AC, LED- MR16385AD, LED- MR16605AW, LED- MR16605AC, LED- MR16605AD, LED- MR161005AW, LED- MR161005AC, LED- MR161005AD: 7,5 W; 625 mA; LED- MR16386AW, LED- MR16386AC, LED- MR16386AD, LED- MR16606AW, LED- MR16606AC, LED- MR16606AD, LED- MR161006AW, LED- MR161006AC, LED- MR161006AD: 4,8 W; 400 mA

Testing procedure and testing location:	
☒ **CB Testing Laboratory:**	SGS-CSTC Standards Technical Services Co., Ltd. - E&E Lab Guangzhou
Testing location/ address .....:	198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, 510663 Guangdong, China
☐ ~~**Associated CB Laboratory:**~~	
~~Testing location/ address .....:~~	
Tested by (name + signature).....:	Alex Tan
Approved by (+ signature).....:	Karen Xie
☐ ~~Testing procedure: TMP~~	
~~Testing location/ address .....:~~	
~~Tested by (name + signature).....:~~	
~~Approved by (+ signature).....:~~	
☐ ~~Testing procedure: WMT~~	
~~Testing location/ address .....:~~	
~~Tested by (name + signature).....:~~	
~~Witnessed by (+ signature).....:~~	
~~Approved by (+ signature).....:~~	
☐ ~~Testing procedure: SMT~~	
~~Testing location/ address .....:~~	
~~Tested by (name + signature).....:~~	
~~Approved by (+ signature).....:~~	
~~Supervised by (+ signature).....:~~	

List of Attachments (including a total number of pages in each attachment):

Attachment 1: European Group Differences and National Differences, total 2 pages;
Attachment 2: EN 62031, total 4 pages;
Attachment 3: Circuit diagram and PCB layout, total 1 page;
Attachment 4: Photo Documentation, total 4 pages.

Summary of testing:

1. The submitted appliances were found to be in compliance with the standards.
2. The LED module has been tested according to EN 62031: 2008 + A1: 2013.
3. The lamp cap was subjected to the gauges tests according to EN 60061-1 and passed.
4. Safety of LED has been judged and belongs to Exempt Risk Group according to standard EN 62471: 2008, detail see report GZES140800981631.
5. The luminaire was found to be compliance with the EMF requirement of EN 62493: 2010, see report GZEM140800437301.
6. Model LED- MR16385AW was selected for full test as it has max. wattage and the smallest lens angle. Other models were conducted construction check.

Tests performed (name of test and test clause):	**Testing location:**
3 Marking 4 Construction 5 External and internal wiring 9 Resistance to dust, solid objects and moisture 10 Insulation resistance and electric strength 11 Creepage distances and clearances 12 Endurance test and thermal test 13 Resistance to heat, fire and tracking	198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, 510663 Guangdong, China

Summary of compliance with National Differences:

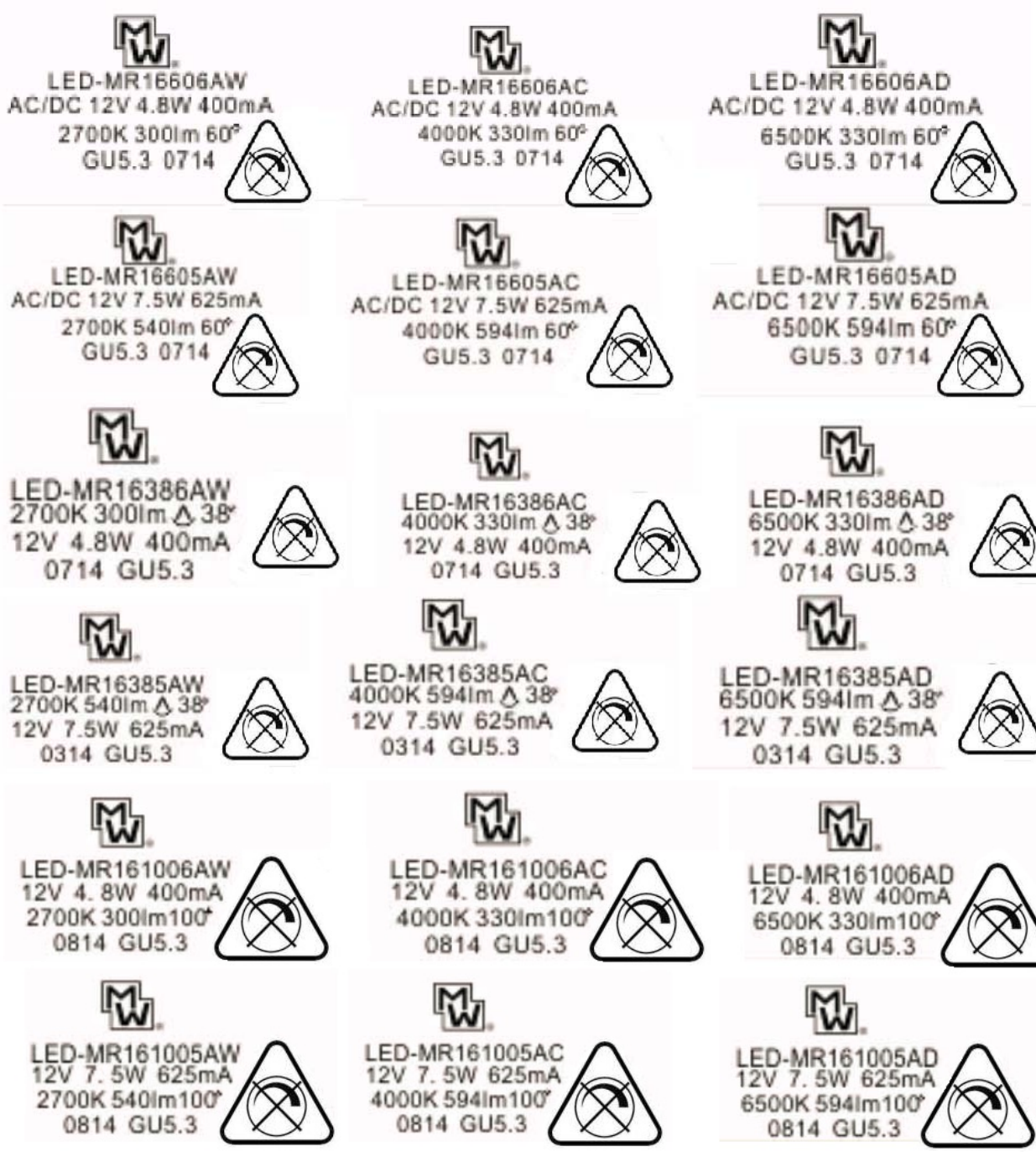
Compliance with CENELEC Common Modifications.

☒ The product fulfils the requirements of EN 60598-1: 2008 + A11: 2009, EN 62031: 2008 + A1: 2013, EN 62471: 2008 and EN 62493: 2010.

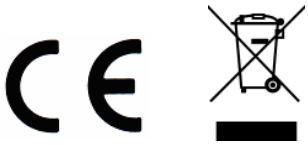
Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Main labels were printed on the enclosure.



Symbols were marked on the user manual and package:



Remarks:
1. The height of graphical symbols shall not be less than 5 mm.
2. The height of letters and numerals shall not be less than 2 mm.
3. The height of WEEE symbol shall not be less than 7 mm.

Test item particulars ..... :	
Classification of installation and use ..... :	Fixed
Supply Connection ..... :	GU5.3 lamp cap
Mass of the equipment..... :	Max. 60 g (LED- MR16385AW)
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)
Testing..... :	
Date of receipt of test item ..... :	2014-08-13
Date (s) of performance of tests..... :	2014-08-13 to 2014-08-29

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 60598-1.

When determining for test conclusion, measurement uncertainty of tests has been considered.

This document is issued by the company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Unless otherwise stated: (a) the results shown in this document refer only to the sample(s) tested and (b) such sample(s) are retained for 12 months. This document cannot be reproduced except in full, without prior approval of the company.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... :

☐ Yes
☒ Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... : Minwa China (Huizhou) Electronics Co., Ltd.
Minwa (Dalian) Industrial Park, Ruhu Town, Huicheng District, Huizhou, 516169, China

General product information:

Non-SELV LED lamps, integrated with GU5.3 lamp cap, non-dimmable.

All models have the same construction and circuit diagram except colour temperature, wattage, lens angle and model no.

Model No.	Rated Input Current	Rated Input Power	Lens angle	Colour temperature
LED- MR16385AW	625 mA	7,5 W	38°	2700K
LED- MR16385AC	625 mA	7,5 W	38°	4000K
LED- MR16385AD	625 mA	7,5 W	38°	6500K
LED- MR16605AW	625 mA	7,5 W	60°	2700K
LED- MR16605AC	625 mA	7,5 W	60°	4000K
LED- MR16605AD	625 mA	7,5 W	60°	6500K
LED- MR161005AW	625 mA	7,5 W	100°	2700K
LED- MR161005AC	625 mA	7,5 W	100°	4000K
LED- MR161005AD	625 mA	7,5 W	100°	6500K
LED- MR16386AW	400 mA	4,8 W	38°	2700K
LED- MR16386AC	400 mA	4,8 W	38°	4000K
LED- MR16386AD	400 mA	4,8 W	38°	6500K
LED- MR16606AW	400 mA	4,8 W	60°	2700K
LED- MR16606AC	400 mA	4,8 W	60°	4000K
LED- MR16606AD	400 mA	4,8 W	60°	6500K
LED- MR161006AW	400 mA	4,8 W	100°	2700K
LED- MR161006AC	400 mA	4,8 W	100°	4000K
LED- MR161006AD	400 mA	4,8 W	100°	6500K

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.2 (0)	**GENERAL TEST REQUIREMENTS**		
1.2 (0.1)	Information for luminaire design considered	Standard EN 62031 Yes ☒ No ☐	—
1.2 (0.3)	More sections applicable .....:	Yes ☐ No ☒	—
1.4 (2)	**CLASSIFICATION**		
1.4 (2.2)	Type of protection ..... :	Class III	—
1.4 (2.3)	Degree of protection..... :	IP00	—
1.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces ..... :	Yes ☒ No ☐	—
1.4 (2.5)	Luminaire for normal use ..... :	Yes ☒ No ☐	—
	Luminaire for rough service ..... :	Yes ☐ No ☒	—
1.5 (3)	**MARKING**		
1.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
1.5 (3.3)	Additional information		P
	Language of instructions	English	P
1.5 (3.3.1)	Combination luminaires		N/A
1.5 (3.3.2)	Nominal frequency in Hz		N/A
1.5 (3.3.3)	Operating temperature		N/A
1.5 (3.3.4)	Symbol or warning notice		N/A
1.5 (3.3.5)	Wiring diagram		N/A
1.5 (3.3.6)	Special conditions		N/A
1.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
1.5 (3.3.8)	Limitation for semi-luminaires		N/A
1.5 (3.3.9)	Power factor and supply current		N/A
1.5 (3.3.10)	Suitability for use indoors		N/A
1.5 (3.3.11)	Luminaires with remote control		N/A
1.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
1.5 (3.3.13)	Specifications of protective shields		N/A
1.5 (3.3.14)	Symbol for nature of supply		N/A
1.5 (3.3.15)	Rated current of socket outlet		N/A
1.5 (3.3.16)	Rough service luminaire		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
1.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
1.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
1.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
1.5 (3.4)	Test with water	15 s	P
	Test with hexane	15 s	P
	Legible after test		P
	Label attached		P
1.6 (4)	**CONSTRUCTION**		
1.6 (4.2)	Components replaceable without difficulty		N/A
1.6 (4.3)	Wireways smooth and free from sharp edges		N/A
1.6 (4.4)	Lampholders		N/A
1.6 (4.4.1)	Integral lampholder		N/A
1.6 (4.4.2)	Wiring connection		N/A
1.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
1.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....:		N/A
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....:		N/A
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
1.6 (4.4.5)	Peak pulse voltage		N/A
1.6 (4.4.6)	Centre contact		N/A
1.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
1.6 (4.4.8)	Lamp connectors		N/A
1.6 (4.4.9)	Caps and bases correctly used		N/A
1.6 (4.5)	Starter holders		N/A
	Starter holder in luminaires other than class II		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Starter holder class II construction		N/A
1.6 (4.6)	Terminal blocks		N/A
	Tails		N/A
	Unsecured blocks		N/A
1.6 (4.7)	Terminals and supply connections		P
1.6 (4.7.1)	Contact to metal parts		N/A
1.6 (4.7.2)	Test 8 mm live conductor		N/A
	Test 8 mm earth conductor		N/A
1.6 (4.7.3)	Terminals for supply conductors		P
1.6 (4.7.3.1)	Welded connections:		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.8.2		N/A
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
1.6 (4.7.4)	Terminals other than supply connection		P
1.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
1.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
1.6 (4.8)	Switches:		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with 61058-1 for electronic switches		N/A
1.6 (4.9)	Insulating lining and sleeves		N/A
1.6 (4.9.1)	Retainement		N/A
	Method of fixing ..... :		N/A
1.6 (4.9.2)	Insulated linings and sleeves		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) ..... :		N/A
1.6 (4.10)	Insulation of Class II luminaires		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
1.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
1.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
1.6 (4.11)	Electrical connections		P
1.6 (4.11.1)	Contact pressure		P
1.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
1.6 (4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
1.6 (4.11.4)	Material of current-carrying parts		P
1.6 (4.11.5)	No contact to wood or mounting surface		P
1.6 (4.11.6)	Electro-mechanical contact systems		N/A
1.6 (4.12)	Mechanical connections and glands		N/A
1.6 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part ..... :		N/A
	Torque test: torque (Nm); part ..... :		N/A
	Torque test: torque (Nm); part ..... :		N/A
1.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
1.6 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :		N/A
	- lampholder; torque (Nm)..... :		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- push-button switches; torque 0,8 Nm..... :		N/A
1.6 (4.12.5)	Screwed glands; force (Nm) ..... :		N/A
1.6 (4.13)	Mechanical strength		P
1.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm)..... :		N/A
	- other parts; energy (Nm) ..... :	Enclosure; 0,35	P
	1) live parts		N/A
	2) linings		N/A
	3) protection		P
	4) covers		P
1.6 (4.13.3)	Straight test finger		P
1.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
1.6 (4.13.6)	Tumbling barrel		N/A
1.6 (4.14)	Suspensions and adjusting devices		N/A
1.6 (4.14.1)	Mechanical load:		N/A
	A) four times the weight		N/A
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm)..... :		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) ..... :		N/A
	Metal rod. diameter (mm) ..... :		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
1.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) ..... :		N/A
	Stress in conductors (N/mm²) ..... :		N/A
	Mass (kg) of semi-luminaire ..... :		N/A
	Bending moment (Nm) of semi-luminaire ..... :		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles ..... :		N/A
	- strands broken		N/A
	- electric strength test afterwards		N/A
1.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
1.6 (4.14.5)	Guide pulleys		N/A
1.6 (4.14.6)	Strain on socket-outlets		N/A
1.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C		P
	- spacing ≥ 30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
1.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
1.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear		N/A
1.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
1.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
1.6 (4.16.3)	Design to satisfy the test of 12.6		N/A
1.6 (4.17)	Drain holes		N/A
	Clearance at least 5 mm		N/A
1.6 (4.18)	Resistance to corrosion:		N/A
1.6 (4.18.1)	- rust-resistance		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.6 (4.18.2)	- season cracking in copper		N/A
1.6 (4.18.3)	- corrosion of aluminium		N/A
1.6 (4.19)	Ignitors compatible with ballast		N/A
1.6 (4.20)	Rough service vibration		N/A
1.6 (4.21)	Protective shield:		N/A
1.6 (4.21.1)	Shield fitted		N/A
	Shield of glass if tungsten halogen lamps		N/A
1.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
1.6 (4.21.3)	No direct path		N/A
1.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment		N/A
1.6 (4.22)	Attachments to lamps		N/A
1.6 (4.23)	Semi-luminaires comply Class II		N/A
1.6 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N/A
1.6 (4.25)	No sharp point or edges		P
1.6 (4.26)	Short-circuit protection:		N/A
1.6 (4.26.1)	Uninsulated accessible SELV parts		N/A
1.6 (4.26.2)	Short-circuit test		N/A
1.6 (4.26.3)	Test chain according to Figure 29		N/A
1.6 (4.27)	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A

1.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		
	Working voltage (V) ..... :	12 V	—
	Voltage form	Sinusoidal ☐ Non-sinusoidal ☐	—
	PTI	< 600 ☐ ≥ 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☐ Category III ☐	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Rated pulse voltage (kV) ..... :		—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm) ..... :		N/A
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm) ..... :		N/A
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm) ..... :		N/A
	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm)..... :		N/A
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm) ..... :		N/A
1.8 (7)	**PROVISION FOR EARTHING**		
1.8 (7.2.1 + 7.2.3)	Accessible metal parts		N/A
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 Ω ..... :		N/A
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a grove		N/A
	Earth makes contact first		
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
1.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N/A
1.8 (7.2.4)	Locking of clamping means		N/A
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
1.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
1.8 (7.2.6)	Earth terminal adjacent to mains terminals		N/A
1.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N/A
1.8 (7.2.8)	Material of earth terminal		N/A
	Contact surface bare metal		N/A
1.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
1.8 (7.2.11)	Earthing core coloured green-yellow		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Length of earth conductor		N/A
1.9 (14)	**SCREW TERMINALS**		
	Separately approved; component list		N/A
	Part of the luminaire		N/A
1.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		
	Separately approved; component list		N/A
	Part of the luminaire		N/A
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
1.10 (5.2)	Supply connection and external wiring		P
1.10 (5.2.1)	Means of connection.....:	GU5.3 lamp cap	P
1.10 (5.2.2)	Type of cable .....:		N/A
	Nominal cross-sectional area (mm²).....:		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
1.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
1.10 (5.2.5)	Type Z not connected to screws		N/A
1.10 (5.2.6)	Cable entries:		N/A
	- suitable for introduction		N/A
	- adequate degree of protection		N/A
1.10 (5.2.7)	Cable entries through rigid material have rounded edges		N/A
1.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
1.10 (5.2.9)	Locking of screwed bushings		N/A
1.10 (5.2.10)	Cord anchorage:		N/A
	- covering protected from abrasion		N/A
	- clear how to be effective		N/A
	- no mechanical or thermal stress		N/A
	- no tying of cables into knots etc.		N/A
	- insulating material or lining		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
1.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
1.10 (5.2.10.3)	Tests:		N/A
	- impossible to push cable; unsafe		N/A
	- pull test: 25 times; pull (N)..... :		N/A
	- torque test: torque (Nm) ..... :		N/A
	- displacement ≤ 2 mm		N/A
	- no movement of conductors		N/A
	- no damage of cable or cord		N/A
1.10 (5.2.11)	External wiring passing into luminaire		N/A
1.10 (5.2.12)	Looping-in terminals		N/A
1.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A
1.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
1.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Appliance couplers of class II type		N/A
1.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
1.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
1.10 (5.3)	Internal wiring		N/A
1.10 (5.3.1)	Internal wiring of suitable size and type		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A)..... :		N/A
	- temperatures ..... :		N/A
	Green-yellow for earth only		N/A
1.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		N/A
	Cross-sectional area (mm²) ..... :		N/A
	Insulation thickness		N/A
	Extra insulation added where necessary		N/A
1.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
1.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
1.10 (5.3.1.4)	Conductors without insulation		N/A
1.10 (5.3.1.5)	SELV current-carrying parts		N/A
1.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
1.10 (5.3.2)	Sharp edges etc.		N/A
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A
	No twisting over 360°		N/A
1.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
1.10 (5.3.4)	Joints and junctions effectively insulated		N/A
1.10 (5.3.5)	Strain on internal wiring		N/A
1.10 (5.3.6)	Wire carriers		N/A
1.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		N/A

1.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		
1.11 (8.2.1)	Live parts not accessible		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not used on the outer surface without appropriate protection		N/A
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arm's reach, on wall-mounted luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		N/A
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
1.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
1.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
1.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
1.11 (8.2.3.c)	Class III luminaires with exposed SELV parts:		N/A
	Ordinary luminaire:		N/A
	- touch current ..... :		N/A
	- no-load voltage ..... :		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage ..... :		N/A
1.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
1.11 (8.2.5)	Compliance with the standard test finger or relevant probe		N/A
1.11 (8.2.6)	Covers reliably secured		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.11 (8.2.7)	Discharging of capacitors ≥ 0,5 μF		N/A
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A
1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		
1.12 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 1.13		—
1.12 (12.3)	Endurance test:		P
	- mounting-position ..... :	Assembly with cap-up	—
	- test temperature (°C) ..... :	35	—
	- total duration (h) ..... :	240	—
	- supply voltage: Un factor; calculated voltage (V):	1,1; 264 V for transformer	—
	- lamp used ..... :	Integral LED module	—
1.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
1.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
1.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
1.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
1.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) ..... :		—
	- case of abnormal conditions..... :		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un . :		—
	- measured mounting surface temperature (°C) at 1,1 Un ..... :		N/A
	- calculated mounting surface temperature (°C) .. :		N/A
	- track-mounted luminaires		N/A
1.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions..... :		—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C)... :		N/A
	- track-mounted luminaires		N/A
1.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
1.12 (12.7.1)	Luminaire without temperature sensing control		N/A
1.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex V:		N/A
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un.. :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test:		N/A
	- part tested; temperature (°C)..... :		N/A
	- part tested; temperature (°C)..... :		N/A
1.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 Un.. :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test:		N/A
	- part tested; temperature (°C)..... :		N/A
	- part tested; temperature (°C)..... :		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
1.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
1.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link	Yes ☐ No ☐	—
	- manual reset cut-out	Yes ☐ No ☐	—
	- auto reset cut-out	Yes ☐ No ☐	—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C): :		—
	Ball-pressure test:		N/A
	- part tested; temperature (°C): :		N/A
	- part tested; temperature (°C): :		N/A

1.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**		
1.13 (-)	If IP > IP 20 the order of the test specified in clause 1.12		—
1.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		N/A
	- classification according to IP :	IP00	—
	- mounting position during test :		—
	- fixing screws tightened; torque (Nm): :		—
	- tests according to clauses :		—
	- electric strength test afterwards		N/A
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		N/A
	c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard		N/A
	d) i) For luminaires without drain holes – no water entry		N/A
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		N/A
1.13 (9.3)	Humidity test 48 h	25 ºC; 93%	P
1.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		
1.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø ..... :		—
	Insulation resistance (MΩ)		—
	SELV:		P
	- between current-carrying parts of different polarity ..... :	>1,3 MΩ	P
	- between current-carrying parts and mounting surface ..... :	>1,3 MΩ	P
	- between current-carrying parts and metal parts of the luminaire ..... :	>1,3 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 .. :		N/A
	Other than SELV:		N/A
	- between live parts of different polarity..... :		N/A
	- between live parts and mounting surface..... :		N/A
	- between live parts and metal parts..... :		N/A
	- between live parts of different polarity through action of a switch ..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 .. :		N/A
1.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V):		P
	SELV:		P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts of different polarity ..... :	500 V	P
	- between current-carrying parts and mounting surface ..... :	500 V	P
	- between current-carrying parts and metal parts of the luminaire ..... :	500 V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 .. :		N/A
	Other than SELV:		N/A
	- between live parts of different polarity..... :		N/A
	- between live parts and mounting surface..... :		N/A
	- between live parts and metal parts..... :		N/A
	- between live parts of different polarity through action of a switch ..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts ..... :		N/A
	- Insulation bushings as described in Section 5 .. :		N/A
1.14 (10.3)	Touch current or protective conductor current (mA) ..... :		N/A

1.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
1.15 (13.2.1)	Ball-pressure test:		P
	- part tested; temperature (°C)..... :	PCB; 137	P
	- part tested; temperature (°C)..... :	Plastic enclosure; 125	P
	- part tested; temperature (°C)..... :	Bobbin of T1; 137	P
	- part tested; temperature (°C)..... :	LED connector; 135	P
1.15 (13.3.1)	Needle flame test (10 s):		N/A
	- part tested..... :		N/A
	- part tested..... :		N/A
1.15 (13.3.2)	Glow-wire test (650°C):		P
	- part tested..... :	PCB	P
	- part tested..... :	Plastic enclosure	P
	- part tested..... :	Bobbin of T1	P
	- part tested..... :	LED connector	P

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- part tested..... :	Lens	P
	- part tested..... :	Self-hardening compound	P
1.15 (13.4.1)	Tracking test:		N/A
	- part tested..... :		N/A
	- part tested..... :		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: components	

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Connector	B	Nan Ya Plastics Corp Plastics 4th Div	1400G1	V-0; 140 °C	EN 60598-1	UL E130155 Tested with appliance
PCB	B	Tak Shing Wiring Board Co., Ltd.	TS13	V-0; 130 °C	EN 60598-1	UL E99664 Tested with appliance
	D	Zhong Ke Da of Boluo Country of Electronic Co., Ltd.	ZKD-2	V-0; 130 °C	EN 60598-1	UL E327899 Tested with appliance
	D	Huizhou Zhenghua Electronics Co., Ltd.	ZH-D	V-0; 130 °C	EN 60598-1	UL E318724 Tested with appliance
Enclosure	B	Silver Age Engineering Plastics (Dongguan) Co., Ltd.	2320	PC; V-0	EN 60598-1	UL E225348 Tested with appliance
LED	B	—	Blue Ingan/ Gan LED QG20(20x20) Chips	I_f=60 mA; 2700 K; 4000 K; 6500 K;	EN 60598-1 EN 62471	Tested with appliance
Transformer	B	Minwa Electronics Co., Ltd.	TF-MR16385	Pri. winding: (5-3); 0,27mm x 1; 160TS Sec. winding: (4-2); 0,27mm x 1; 3TS	EN 60598-1	Tested with appliance
-- Winding	B	Tai-I Electric Wire & Cable Co., Ltd.	UEW	Polyurethane; 130 °C	EN 60598-1	UL E85640 Tested with appliance
	D	Tachyang (Huizhou) Copper Wire Mfr	UEW	Polyurethane; 130 °C	EN 60598-1	UL E200536 Tested with appliance
-- Bobbin	B	Chang Chun Plastics Co., Ltd.	T375J	V-0; 150 °C	EN 60598-1	UL (E59481) Tested with appliance
-- Tape	B	Jingjiang Yahua Pressure Sensitive Glue Co., Ltd.	PZ	130 °C	EN 60598-1	UL E165111 Tested with appliance
	D	Pantech Tape Co., Ltd.	25(b)	130 °C	EN 60598-1	UL E117836 Tested with appliance

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Self-hardening compound	B	Mianyang Wells Electronic Materials Co., Ltd.	WR7306	150 °C; V-0	EN 60598-1	UL E223455 Tested with appliance

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: temperature measurements, thermal tests of Section 12	

	Type reference ..... :	LED- MR16385AW	—
	Lamp used..... :	Integral LED module	—
	Lamp control gear used ..... :	Integral LED driver	—
	Mounting position of luminaire ..... :	Assembly with cap-up	—
	Supply wattage (W)..... :	7,66	—
	Supply current (A) ..... :	0,60	—
	Calculated power factor ..... :	—	—
	Table: measured temperatures corrected for ta = 25 °C:		P
	- abnormal operating mode..... :	Short-circuited of LEDs	—
	- test 1: rated voltage ..... :	—	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage..... :	240 V x 1,06 = 254,4 V for transformer	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage ..... :	—	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage..... :	240 V x 1,1 = 264 V for transformer	—
	Through wiring or looping-in wiring loaded by a current of A during the test ..... :	—	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Lamp cap	—	79,1	—	145	—	—
Electrolytic capacitor C3	—	110,2	—	125	117,4	135
Bobbin of T1	—	111,9	—	150	—	—
Winding of T1	—	110,8	—	130	132,2	175
Tape of T1	—	110,7	—	130	—	—
PCB	—	111,2	—	130	—	—
LED connector	—	109,6	—	Ref.	—	—
Inner surface of plastic enclosure	—	108,3	—	Ref.	—	—
External surface of plastic enclosure	—	99,1	—	Ref.	—	—
Tc of LED	—	97,8	—	Ref.	—	—
Lens (internal)	—	81,5	—	Ref.	—	—

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 3: screw terminals (part of the luminaire)	

(14)	**SCREW TERMINALS**		
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²).....:		N/A
(14.3.3)	Conductor space (mm).....:		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread)..:	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) .....:		N/A
	Torque (Nm).....:		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 4: screwless terminals (part of the luminaire)	

(15)	**SCREWLESS TERMINALS**		
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples)….:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)……:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.2)	Permanent connections: pull-off test (20 N)		N/A
(15.6)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles.....:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
(15.7)	Terminals external wiring		N/A
	Terminal size and rating		N/A

IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:										N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....:										N/A
(15.9)	Contact resistance test										N/A
	Voltage drop (mV) after 1 h										N/A
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV)..... :										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV)..... :										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV)..... :										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV)..... :										—
terminal		1	2	3	4	5	6	7	8	9	10
voltage drop (mV)											

Attachment 1: European Group Differences and National Differences for IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60598-2-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Luminaires
Part 2: Particular requirements:
Section One – Fixed general purpose luminaires

Differences according .....: EN 60598-2-1: 1989 used in conjunction with EN 60598-1: 2008 + A11:2009

Annex Form No.....: EU_GD_IEC60598_2_1C

Annex Form Originator .....: IMQ S.p.A.

Master Annex Form.....: 2013-02

Copyright © 2013 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.

	CENELEC COMMON MODIFICATIONS (EN)		
1.5 (3)	**MARKING**		
1.5 (3.3.101)	Adequate warning on the package		N/A
1.6 (4)	**CONSTRUCTION**		
1.6 (4.11.6)	Electro-mechanical contact systems		N/A
1.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
1.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
1.10 (5.2.2)	Cables equal to HD21 S2 or HD22 S2		N/A
1.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		
1.12 (12.4.2c)	Thermal test (normal operation)		N/A
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)**		
(3.3)	DK: power supply cord with label		Not checked
	IT: warning label on Class 0 luminaire		Not checked

Attachment 1: European Group Differences and National Differences for IEC 60598-2-1			
Clause	Requirement + Test	Result - Remark	Verdict
(4.5.1)	DK: socket-outlets		Not checked
(5.2.1)	CY, DK, FI, SE, GB: type of plug		Not checked
ZC	**ANNEX ZC, NATIONAL DEVIATIONS (EN)**		
(4 & 5)	FR: Shuttered socket-outlets 10/16A		Not checked
(13.3)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public or 960°C for luminaires in emergency exits		Not checked
(13.3)	GB: Requirements according to United Kingdom Building Regulation		Not checked

Attachment 2: EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N/A
5	**GENERAL TEST REQUIREMENTS**		
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	(see Annex 1)	N/A
	General conditions for tests in Annex A	(see Annex A)	N/A
6	**CLASSIFICATION**		
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
7	**MARKING**		**N/A**
8	**TERMINALS**		**N/A**
9 (9)	**PROVISION FOR PROTECTIVE EARTHING**		**N/A**
10 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		**N/A**
11 (11)	**MOISTURE RESISTANCE AND INSULATION**		
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		P
	For basic insulation ≥ 2 MΩ ..... :	> 2,6 MΩ	P
	For double or reinforced insulation ≥ 4 MΩ ..... :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

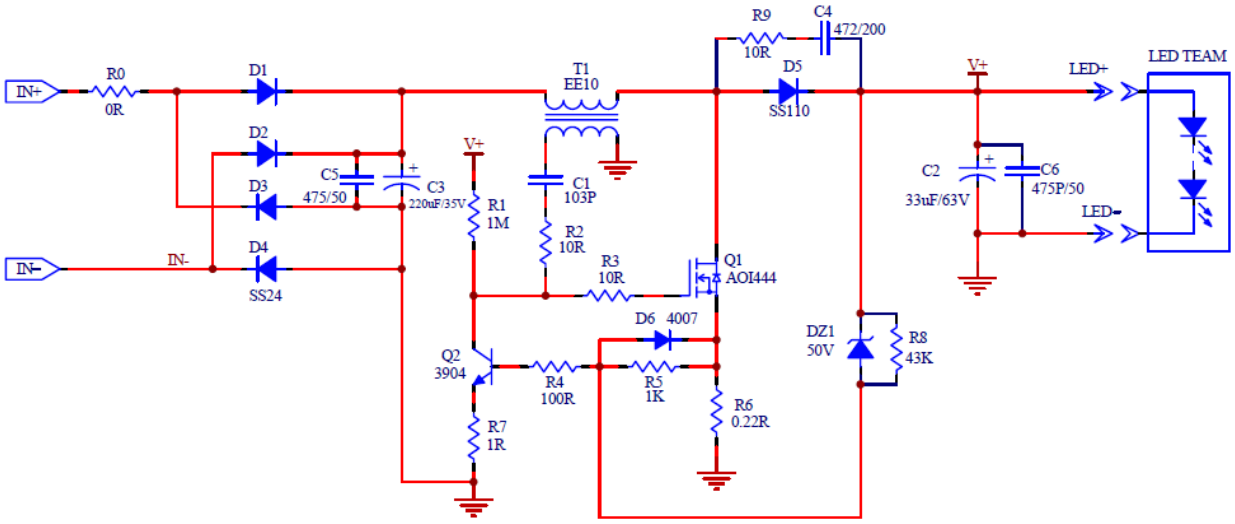
Attachment 2: EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
12 (12)	**ELECTRIC STRENGTH**		
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		N/A
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		N/A
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A
13 (14)	**FAULT CONDITIONS**		
- (14)	When operated under fault conditions the controlgear:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance ≥ 1 MΩ ..... :	> 1,3 MΩ	P

Attachment 2: EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		—
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	During the tests, tissue paper, spread below module, does not ignite		P
15	**CONSTRUCTION**		
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
16	**CREEPAGE DISTANCES AND CLEARANCES**		
17 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		P
(4.11)	Electrical connections		P
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		N/A
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part ..... :		N/A
	Torque test: torque (Nm); part ..... :		N/A

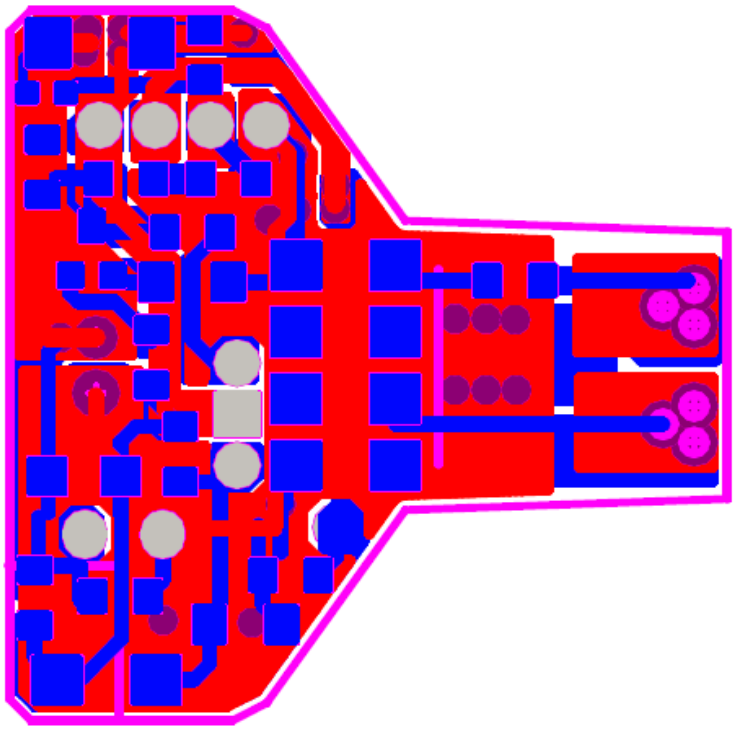
Attachment 2: EN 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Torque test: torque (Nm); part ..... :		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm)..... :		N/A
	- lampholder; torque (Nm)..... :		N/A
	- push-button switches; torque 0,8 Nm..... :		N/A
(4.12.5)	Screwed glands; force (Nm) ..... :		N/A
18 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		**N/A**
19 (19)	**RESISTANCE TO CORROSION**		**N/A**
20	**INFORMATION FOR LUMINAIRE DESIGN**		
	Information in Annex D		—
21	**HEAT MANAGEMENT**		**N/A**
14	**TABLE: tests of fault conditions**		
Part	Simulated fault		Hazard
D1	Short circuit		NO
D1	Open circuit		NO
C3	Short circuit		NO
Q2 c/e	Short circuit		NO
D6	Short circuit		NO
D5	Short circuit		NO
Q2 S/D	Short circuit		NO
DZ1	Short circuit		NO
C2	Short circuit		NO
C2	Open circuit		NO
A	**ANNEX A - TESTS**		
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		N/A

Attachment 3: Circuit diagram and PCB layout

Circuit diagram for all models:



PCB layout:



Attachment 4: Photo documentation

Details of: General view (different lens angle)

View:

[x] general

[ ] front

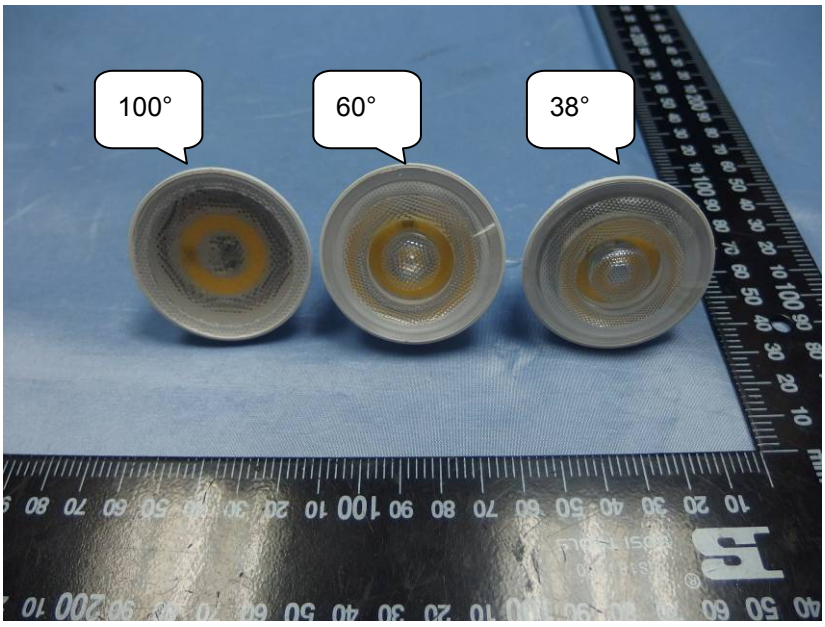
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of: General view (different lens angle)

View:

[x] general

[ ] front

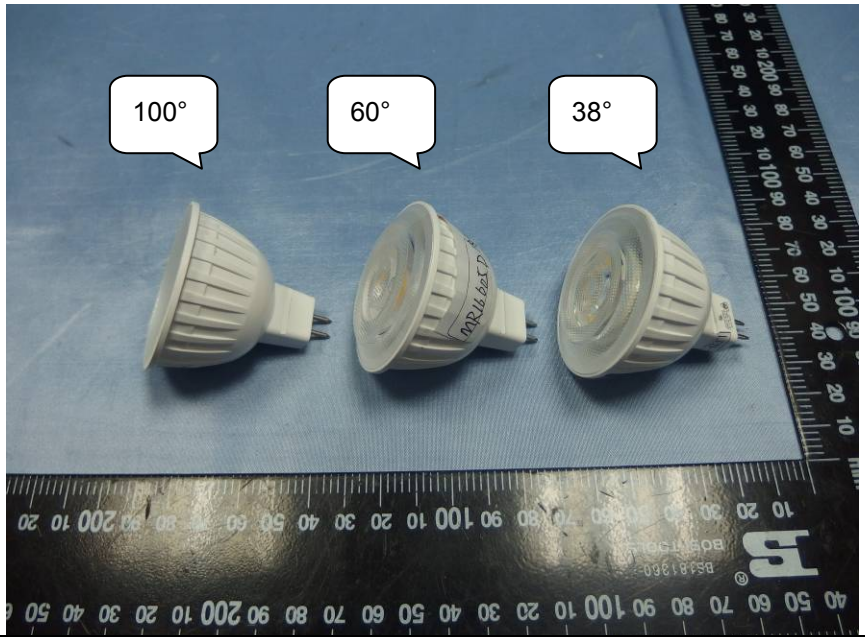
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Attachment 4: Photo documentation

Details of: LED module for all models, only colour temperature difference.

View:

[x] general

[ ] front

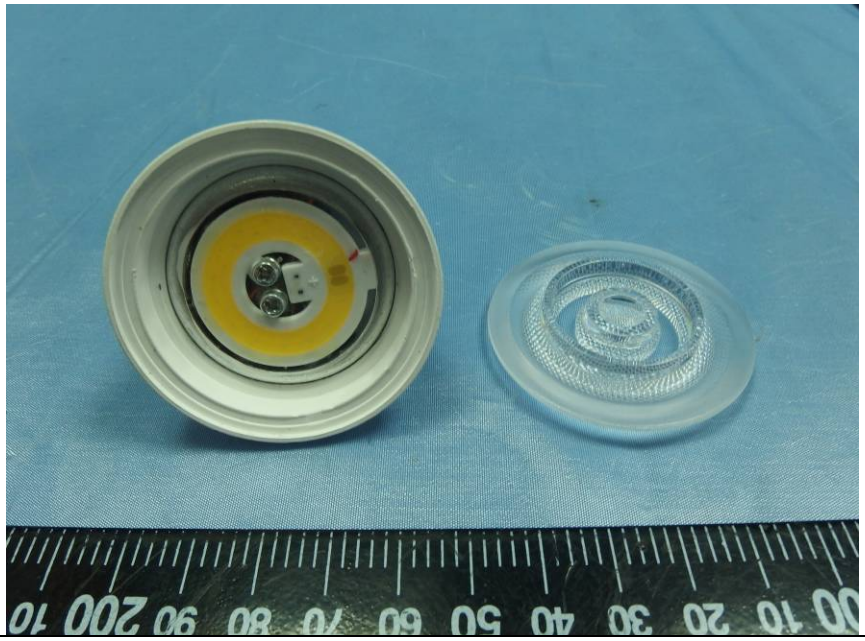
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of: Internal view for all models, filled with self-hardening compound

View:

[x] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Attachment 4: Photo documentation

Details of: Internal view for all models, without self-hardening compound

View:

[x] general

[ ] front

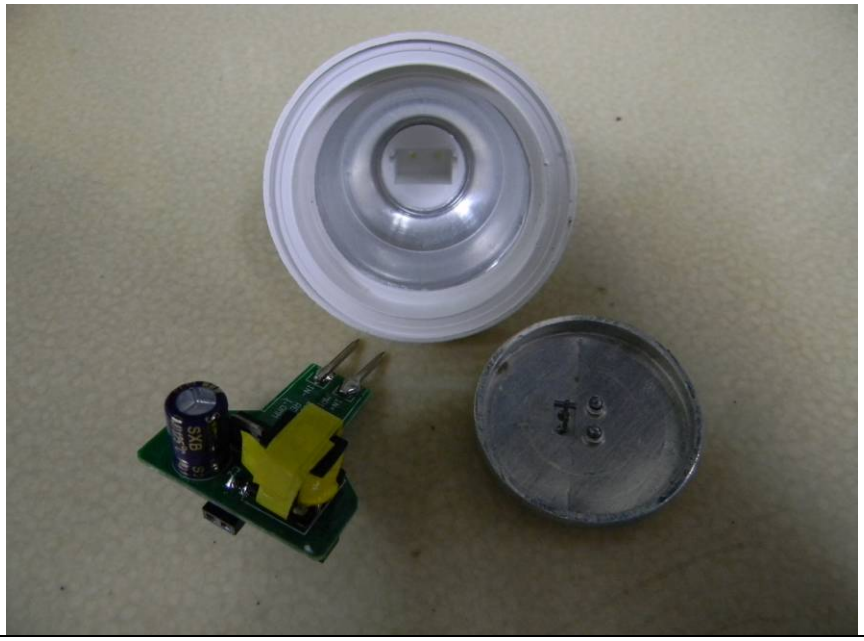
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of: One side of PCB for all models

View:

[x] general

[ ] front

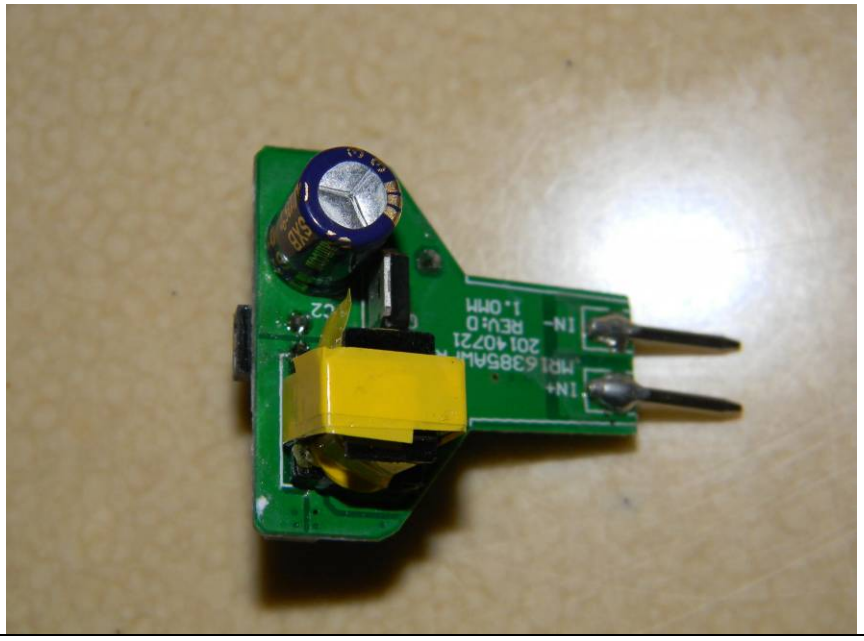
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Attachment 4: Photo documentation

Details of: Another side of PCB for all models

View:

[x] general

[ ] front

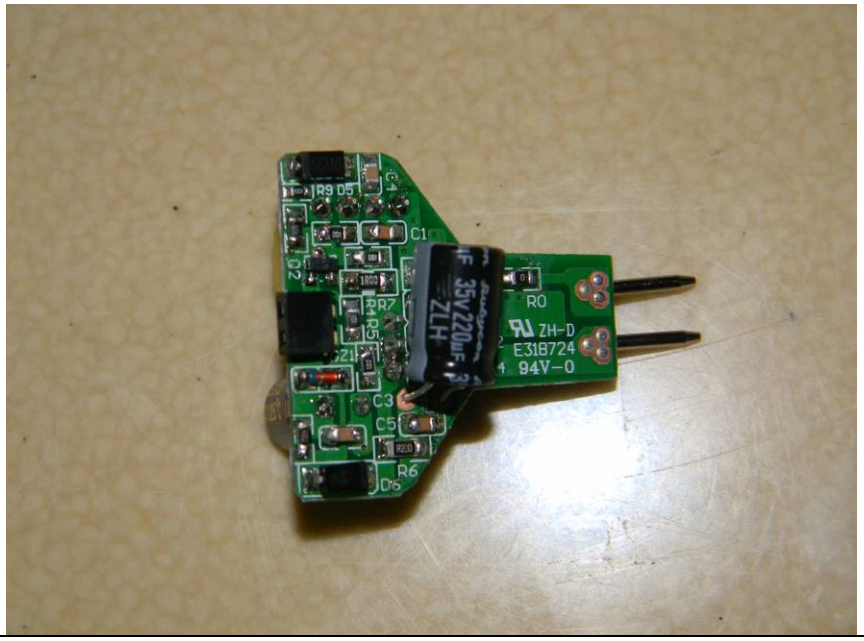
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



- - - End of Report - - -